

What is claimed is:

1. A passive entry system for a vehicle of a particular model, said vehicle having an interior and an exterior, said system comprising:

5           an internal antenna disposed in said interior;  
          an external antenna disposed in said exterior;  
          at least one amplifier driving at least one of said antennas and having a configurable gain; and  
          a controller coupled to said amplifier for transferring at least one of internal  
10       and external software-configured gain values to said amplifier for controlling a transmission power of interrogation signals broadcast by said internal and external antennas, respectively, said software-configured gain values being obtained in an advance calibration procedure with respect to said particular model of said vehicle.

15       2. The passive entry system of claim 1 further comprising:  
          a portable fob for receiving said interrogation signals from said antennas and transmitting a response message to said controller, said response message including an indication of a received signal strength of a corresponding interrogation signal;

20       wherein said controller determines whether said portable fob is located in said interior or said exterior in response to said indication of received signal strength.

3. The passive entry system of claim 2 wherein said controller sequentially generates a first interrogation signal via one of said internal antenna or said external  
25       antenna, generates a second interrogation signal via the other one of said internal antenna or said external antenna, receives said response message, and compares said indication of received signal strength corresponding to said first and second interrogation signals to localize said fob.

4. The passive entry system of claim 1 comprising first and second amplifiers for driving said interior and exterior antennas, respectively, and for receiving said interior and exterior software-configured gain values, respectively.

5 5. The passive entry system of claim 1 further comprising a switch for selectably coupling said amplifier to either said interior antenna or said exterior antenna.

6. The passive entry system of claim 1 wherein said controller generates  
10 said interrogation signals in response to a user request for a passive entry function.

7. The passive entry system of claim 6 wherein said user request identifies a selected one of a plurality of passive entry functions, and wherein said interior and exterior software-configured gain values are determined in response to said selected  
15 one of said passive entry functions.

8. The passive entry system of claim 7 wherein said plurality of passive entry functions includes a vehicle unlock function and an engine start function, wherein said exterior software-configured gain value is boosted relative to said interior  
20 software-configured gain value when said vehicle unlock function is selected, and wherein said interior software-configured gain value is boosted relative to said exterior software-configured gain value when said engine start function is selected.

9. A method of operating a passive entry system for a vehicle of a particular  
25 model, said vehicle having an interior and an exterior, an interior antenna disposed in said interior, an exterior antenna disposed in said exterior, at least one amplifier driving at least one of said antennas and having a configurable gain, and a controller coupled to said amplifier for controlling said configurable gain, said passive entry

system further including a portable fob to be carried by a user, said method comprising the steps of:

detecting a user request for a passive entry function;

transferring at least one of an interior software-configured gain value or an exterior software-configured gain value to said amplifier, said software-configured gain values being obtained in an advance calibration procedure with respect to said particular model of said vehicle;

transmitting first and second interrogation signals from said interior antenna and said exterior antenna, respectively, having a transmission power according to said software-configured gain values;

receiving said interrogation signals in said fob;

transmitting from said fob a response message including respective indications of a received signal strength;

receiving said response message in said controller;

determining whether said portable fob is located in said interior or said exterior in response to said indications of received signal strength; and

performing said requested passive entry function if said determined location matches an expected location corresponding to said requested passive entry function.

10. The method of claim 9 wherein said controller sequentially generates a first interrogation signal via one of said internal antenna or said external antenna, generates a second interrogation signal via the other one of said internal antenna or said external antenna, receives said response message, and compares said indications of received signal strength to localize said fob.

11. The method of claim 9 wherein said user request identifies a selected one of a plurality of passive entry functions, and wherein said interior and exterior software-configured gain values are determined in response to said selected one of said passive entry functions.

12. The method of claim 9 wherein said plurality of passive entry functions includes a vehicle unlock function and an engine start function, wherein said exterior software-configured gain value is boosted relative to said interior software-configured gain value when said vehicle unlock function is selected, and wherein said interior software-configured gain value is boosted relative to said exterior software-configured gain value when said engine start function is selected.

13. The method of claim 9 wherein said advance calibration procedure comprises the steps of:

placing a test fob at an inside border position in said interior of said particular model;

selecting an initial value for said software-configured interior gain value;

transmitting an interrogation signal using said initial value;

receiving a response message from said test fob including said indication of received signal strength;

comparing said indicated received signal strength with a predetermined range of signal strength;

if said indicated received signal strength is outside said predetermined range of signal strength then iteratively modifying said software-configured interior gain value and repeating said transmitting, receiving, and comparing steps until said software-configured interior gain value has a final value that results in said indicated received signal strength being within said predetermined range of signal strength; and

storing said final value for inclusion in software contained in said passive entry system for said particular model.

14. The method of claim 13 wherein said advance calibration procedure further comprises the steps of:

placing a test fob at an outside border position in said exterior of said particular model;

selecting an initial value for said software-configured exterior gain value;

transmitting an interrogation signal using said initial value;

5 receiving a response message from said test fob including said indication of received signal strength;

comparing said indicated received signal strength with a predetermined range of signal strength;

10 if said indicated received signal strength is outside said predetermined range of signal strength then iteratively modifying said software-configured exterior gain value and repeating said transmitting, receiving, and comparing steps until said software-configured exterior gain value has a final exterior value that results in said indicated received signal strength being within said predetermined range of signal strength; and

15 storing said final exterior value for inclusion in software contained in said passive entry system for said particular model.